

CLAIMS

What is claimed is:

1. A semiconductor device comprising:
a silicide source and a silicide drain;
a semiconductor body disposed between the source and the drain;
a gate electrode disposed over the body and defining a channel interposed between the source and the drain; and
a gate dielectric made from a high-K material and separating the gate electrode and the body.
2. The semiconductor device according to claim 1, wherein the semiconductor device is configured as a MOSFET.
3. The semiconductor device according to claim 1, wherein the gate is comprised of a metal containing material.
4. The semiconductor device according to claim 3, wherein the gate electrode is composed of one or more materials selected from titanium nitride, tantalum nitride, tungsten, tantalum, aluminum, nickel, ruthenium, rhodium, palladium, platinum and combinations thereof.
5. The semiconductor device according to claim 1, wherein the high-K material is composed of one or more materials selected from hafnium oxide, zirconium oxide, cerium oxide, aluminum oxide, titanium oxide, yttrium oxide, barium strontium titanate and mixtures thereof.
6. The semiconductor device according to claim 1, further comprising a buffer interface disposed between the body and the gate dielectric.

7. The semiconductor device according to claim 6, wherein the buffer interface is formed from an oxide having a thickness of about 0.5 nm to about 0.7 nm.

8. The semiconductor device according to claim 1, wherein the silicide of the source and the drain is formed by reacting nickel with a layer of semiconductor material, the body being formed from the layer of semiconductor material.

9. The semiconductor device according to claim 1, further comprising a liner disposed adjacent sidewalls defined by the gate electrode and gate dielectric.

10. The semiconductor device according to claim 1, wherein the body is formed from a semiconductor film disposed on an insulating layer, the insulating layer being disposed on a semiconductor substrate.

11. A method of fabricating a semiconductor device comprising:
providing a wafer including a layer of semiconductor material;
forming a layer of high-K dielectric material over the layer of semiconductor material;
forming a gate electrode over the layer of high-K material;
removing a portion of the layer of high-K dielectric material extending laterally beyond the gate electrode to form a gate dielectric, the gate electrode and the gate dielectric forming a gate having laterally opposed sidewalls;
forming a liner disposed adjacent each sidewall of the gate electrode; and
siliciding the layer of semiconductor material to form a metal containing source and a metal containing drain, thereby forming a semiconductor body between the source and the drain, the body having a channel defined by the gate electrode.

12. The method according to claim 11, wherein the semiconductor device is configured as a MOSFET.

13. The method according to claim 11, wherein the gate is comprised of a metal containing material.

14. The method according to claim 13, wherein the gate electrode is composed of one or more materials selected from titanium nitride, tantalum nitride, tungsten, tantalum, aluminum, nickel, ruthenium, rhodium, palladium, platinum and combinations thereof.

15. The method according to claim 11, wherein the high-K material is composed of one or more materials selected from hafnium oxide, zirconium oxide, cerium oxide, aluminum oxide, titanium oxide, yttrium oxide, barium strontium titanate and mixtures thereof.

16. The method according to claim 11, further comprising forming a buffer interface disposed between the body and the gate dielectric.

17. The method according to claim 17, wherein the buffer interface is formed from an oxide having a thickness of about 0.5 nm to about 0.7 nm.

18. The method according to claim 11, wherein the silicide of the source and the drain is formed by reacting nickel with a layer of semiconductor material.

19. The method according to claim 11, wherein the layer of semiconductor material is a semiconductor film disposed on an insulating layer, the insulating layer being disposed on a semiconductor substrate.